

Recent Measurements of Longitudinal and Transverse Unpolarized Structure Functions, and Their Impact on Spin Asymmetry Measurements

C. Keppel

Hampton University/Jefferson Laboratory

In inclusive electron-nucleon scattering, the extraction of polarized structure functions from spin asymmetry measurements often requires knowledge of the complete unpolarized structure functions. High precision measurements of $R(x, Q^2) = \sigma_L / \sigma_T$, the ratio of longitudinal to transverse cross sections, have been available for over a decade in the high Q^2 DIS region, and have been used to extract the spin structure functions in this region. However, the current world's data on $R(x, Q^2)$, and therefore, the longitudinal and transverse structure functions, $F_L(x, Q^2)$ and $F_1(x, Q^2)$, in the larger x and low to moderate Q^2 regime have been both sparse and low quality. Recently, experiment E94-110 was performed in Hall C at JLAB to provide high precision data on R in the kinematic range defined by $0.2 < x < 0.85$ and $0.5 < Q^2 < 4.0(\text{GeV}/c)^2$. A global fit of $R(x, Q^2)$ in this region has been obtained, in addition to over 150 Rosenbluth separations to extract $R(x, Q^2)$. Results of the analysis of this new data will be presented, as well it's non-trivial impact on spin asymmetry measurements at comparable kinematics.